



**UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

HA

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
-----------------	-------------	----------------------	---------------------

09/471,981 12/23/99 IGAKI

E MTS-3181US

EXAMINER

MM91/0806

ALLAN RATNER
RATNER & PRESTIA
SUITE 301 ONEW WESTLAKES BERWYN
P O BOX 980
VALLEY FORGE PA 19482-0980

LOPER, R	
ART UNIT	PAPER NUMBER

2853
DATE MAILED:

08/06/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/471,981

Applicant(s)

IGAKI ET AL.

Examiner

Robert D Loper

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5 and 39-80 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,4,5,40,41,43,53 and 56 is/are allowed.
- 6) ☒ Claim(s) 3,39,42,44-52,54,55,57,58,60-64,71 and 76-80 is/are rejected.
- 7) ☒ Claim(s) 59,65-70 and 72-75 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 December 1999 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6,7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 52 (page 9, line 26), 17c (page 10, line 7), 54b (page 10, line 13), 64b (page 10, line 13). Correction is required.
2. The drawings are objected to because in Fig. 10, "l₁" should be replaced with --L₁-- and "l₂" should be replaced with --L₂--. Correction is required.

Specification

3. The disclosure is objected to because of the following informalities: On page 32, line 10, the formula " $X \leq P/m$ " is cited, but "m" is not identified.
Appropriate correction is required.
4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.
5. A substitute specification including the claims is required pursuant to 37 CFR 1.125(a) because of the presence of marks on the pages (vertical lines about 1.6 inches from the left edge of the pages and some marks about 1.7 inches from the right edge of the pages, e.g., page 23) that are not pertinent to the subject matter and that may interfere with publication.
A substitute specification filed under 37 CFR 1.125(a) must only contain subject matter from the original specification and any previously entered amendment under 37 CFR 1.121. If the substitute specification contains additional subject matter not of record, the substitute specification must be filed under 37 CFR 1.125(b) and must be

accompanied by: 1) a statement that the substitute specification contains no new matter; and 2) a marked-up copy showing the amendments to be made via the substitute specification relative to the specification at the time the substitute specification is filed.

Claim Objections

6. Claim 76 is objected to because of the following informalities: In line 2, "same" should be replaced with --thickness--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 51, 52, 54, 55, 57, 60 and 77-80 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 51 and 54 each recite the limitation "said fixed wall" in line 2. There is insufficient antecedent basis for this limitation in the claim. Two fixed walls are claimed in claim 1, upon which claims 51 and 54 depend.

Claims 52, 55, and 57 each recite the limitation "said fixed wall" in line 2. There is insufficient antecedent basis for this limitation in the claim. Two fixed walls are claimed in claim 3, upon which claims 52, 55, and 57 depend.

Claim 60 recites the limitation "said electrode" in line 2. There is insufficient antecedent basis for this limitation in the claim. At least two electrodes are claimed in claim 3, upon which claim 42 depends.

Claim 77 recites the limitation " $X \leq P/m$ " in line 8. There is insufficient antecedent basis for this limitation in the claim. Specifically, "m" is never identified.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 3, 44, 58, 61-64, 71, and 76 are rejected under 35 U.S.C. 102(b) as being anticipated by Michaelis et al. (EP 0 277 703 A1).

Michaelis et al. discloses (Figs. 9(a)-10(b); column 14, line 56, through column 15, line 34) an ink-jet recording head comprising at least one piezoelectric block (B) (see Fig. 10(b)). Each piezoelectric block (B) has first and second ink pressure chambers **613** (not labeled in Fig. 10(b)), each pressure chamber communicating with a nozzle (Fig. 9(b), element **618**), first and second partition walls **603**, each partition wall serving as a driving portion for one of the ink pressure chambers, each partition wall including a piezoelectric element (**605**, **607**) and two electrodes (**619**, **621**) for driving said piezoelectric element, a pressure buffer chamber **615**, and first and second fixed walls **630**. The first fixed wall, the first ink pressure chamber, the first partition wall, the pressure buffer chamber, the second partition wall, the second ink pressure chamber, and the second fixed wall are arranged in sequence along a thickness direction.

With respect to claim 44, shown in Fig. 10(b) are a plurality of these blocks, arranged in the thickness direction. With respect to claim 58, the pressure buffer chambers are all closed on a side at which the nozzle communicating with the ink pressure chamber is open (see Fig. 9(b)). With respect to claims 61-64, there are exactly two electrodes per partition wall, one of which is exposed to the pressure buffer and the other exposed to the ink pressure chamber. With respect to claim 71, a portion at which the electrodes on a partition wall face each other is included in a portion at which the ink pressure chamber and pressure buffer chamber face each other (Figs. 9(b) and 10(b)). With respect to claim 76, the distance between nozzles appears to be constant (Fig. 10(b)).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 39, 42, and 46-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Michaelis et al. (EP 0 277 703 A1).

Michaelis et al. discloses an invention of the type claimed, except for its method of manufacture.

Regardless of the method of production, the product is disclosed by Michaelis et al.. The limitations added by claims 39, 42, and 46-50 are limitations on how the recording head is produced. Thus, these claims are product-by-process claims (See MPEP §2113).

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)

10. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Michaelis et al. (EP/0 277 703 A1) in view of Kishi (US 6095641 A).

Michaelis et al. discloses an invention of the type claimed, except that piezoelectric blocks (B) are not repeatedly arranged in a direction perpendicular to the thickness direction.

Kishi teaches (Fig. 1; column 2, lines 1-4) that one would stack piezoelectric blocks in a direction perpendicular to the thickness direction. Kishi suggests that this method is commonly used to allow for color printing.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Michaelis et al. to incorporate the teaching of Kishi. One would have been motivated to make such a modification by the suggestion of Kishi that it is commonly used to allow for color printing.

Allowable Subject Matter

11. Claims 1, 4, 5, 40, 41, 43, 53, and 56 are allowed.

The primary reason for the allowance of claims 1, 4, 5, 40, 41, 43, 53, and 56 is the inclusion of the limitation in claims 1 and 4 of one of the fixed walls to be disposed adjacent to the ink pressure chamber and another of the fixed walls to be disposed adjacent to the pressure buffer chamber. It is this limitation found in each of the claims, as it is claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

12. Claims 59, 65-70, and 72-75 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

With regard to claim 59, the limitation the pressure buffer chamber to communicate with an air inlet/outlet path connected outside of the recording head was not suggested by any of the references considered by the examiner, and its inclusion with the other claimed limitations would make these claims allowable over the prior art.

With regard to claims 65-67, the limitation of both electrodes to be embedded inside the partition wall was not suggested by any of the references considered by the examiner, and its inclusion with the other claimed limitations would make these claims allowable over the prior art.

With regard to claim 68, the limitation of at least one electrode to be further disposed between the two electrodes was not suggested by any of the references considered by the examiner, and its inclusion with the other claimed limitations would make these claims allowable over the prior art.

With regard to claims 69 and 70, the limitation of the electrode at the surface exposed to the ink pressure chamber to be grounded was not suggested by any of the references considered by the examiner, and its inclusion with the other claimed limitations would make these claims allowable over the prior art.

With regard to claim 72, the limitation of a length of one of the electrodes in a direction perpendicular to the thickness direction to be different from a length of the other electrode adjacent to said one electrode in the same direction was not suggested by any of the references considered by the examiner, and its inclusion with the other claimed limitations would make these claims allowable over the prior art.

With regard to claim 75, the limitation of a length of the ink pressure chamber in a direction perpendicular to the thickness direction to be different from a length of the pressure buffer chamber in the same direction was not suggested by any of the references considered by the examiner, and its inclusion with the other claimed limitations would make these claims allowable over the prior art.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert D Loper whose telephone number is (703)306-5717. The examiner can normally be reached on M-F (7:00-4:30, alternate Fridays off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E Barlow can be reached on (703)308-3126. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7725 for regular communications and (703)308-7725 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)306-3431.

RDL

RDL
August 1, 2001


John Barlow
Supervisory Patent Examiner
Technology Center 2800